

TEXAS REGIONAL EDUCATION SERVICE CENTER SCHOOL HEALTH
SPECIALISTS' PERCEPTIONS REGARDING THE TRAINING, EDUCATION AND
POLICIES OF ADOLESCENT ASTHMA MANAGEMENT

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CHAPTER I

INTRODUCTION

Asthma is a common chronic disease and a public health concern within the United States (Merkle, Wheeler, Gerald, & Taggart, 2006). Affecting an estimated 20.3 million persons of all ages and races, asthma ranks among the most common chronic conditions in the U.S. (CDC, 2009). Children with asthma are more likely to miss more school days. The Center for Disease Control’s Guide for State Health Agencies in the Development of Asthma Programs (2009) found “children with asthma miss an average of twice as many school days as other children, with 21% of children with asthma in one study sample missing over two weeks of school a year from asthma.” Therefore, asthma is not only impacting youths’ physical well being, but also their educational development.

Adolescents with asthma are able to find support through parents, physicians and other health professionals. Ongoing research is needed to assess the effectiveness of these sources. School-based asthma education and support might facilitate the needs of adolescents and may further develop the participants’ knowledge of asthma, and encourage them to adhere to asthma management guidelines.

This study is designed to examine the perceptions regarding the training, involvement and policies of adolescent asthma management from the perspectives of School Health Specialists in the Texas Regional Education Service Centers. In accordance with the Texas Department of State Health Services each Regional Education

Service Center is employed with a Regional School Health Specialist who (a) provides districts with professional development training, workshops, and technical assistance on health topics or legal issues and (b) maintains an active network of agencies in both the public and private sector that provides support for the local district and regional health efforts.

The Diffusion of Innovations Theory provided the theoretical framework for this study. The theory acts as a valuable tool for social change as well as change within an individual or organization. The Diffusion of Innovations Theory was chosen to provide further insight into the adoption process of a new idea, product or practice.

Participants were selected using the Regional Education Service Centers' current listing of School Health Specialists available through the Texas Education Agency (TEA) website. An online survey was emailed to the School Health Specialist representing each region. All School Health Specialists receiving and completing the online survey were included in the data analysis.

The results from this study benefit the profession of health education in furthering the perceptions regarding training, involvement and policies of adolescent asthma management. The School Health Specialist provides further insight to the knowledge and involvement in adolescent asthma management from the schools standpoint. Additionally, this study can provide research on school-based asthma education to other facilities outside the state of Texas.

Statement of Purpose

The purpose of this study was to examine Texas Regional Education Service Center School Health Specialists' perceptions regarding the training, education and policies of adolescent asthma management.

Research Questions

To more fully understand asthma management in Texas middle schools, the following research questions were examined:

1. What is the School Health Specialists' knowledge level of training, education and policies for adolescent asthma management in their respective Regional Education Service Center?
2. What are the School Health Specialists' perceptions of training for adolescent asthma management in their respective Regional Education Service Center?
3. What are the School Health Specialists' perceptions of education for adolescent asthma management in their respective Regional Education Service Center?
4. What are the School Health Specialists' perceptions of policies for adolescent asthma management in their respective Regional Education Service Center?

Limitation and Delimitations

While conducting the study, limitations and delimitations were established. The limitations of this study are (a) School Health Specialists' previous knowledge of asthma management, (b) School Health Specialists' opinion of asthma management, and (c) the risk that School Health Specialist's will not participate fully or honestly to survey questions. Additionally, the small sample size and the survey, a new tool developed by

incorporating a variety of question from previous instruments (ALA, 2007), prior knowledge and the literature, provided limitations to the study. The delimitations in this study established restrictions to School Health Specialists' in Texas, up to two School Health Specialists per region, and School Health Specialists' who were employed at their respective RESC during the time the survey was conducted.

Assumptions

For this research, it was assumed that School Health Specialists are concerned with the obstacles facing middle school students with asthma and the impact asthma has on school performance and attendance. Further, it was assumed that this concern will motivate School Health Specialists' to participate in the study and that lack of proper asthma management requires valid evaluations. During this study, the researcher assumes that (a) School Health Specialists will have previous knowledge of asthma and asthma management plans, (b) School Health Specialists will answer the survey questions posed by the researcher in a timely and honest manner, and (c) there will be enough responses to reflect the purpose of the study, given the small sample size of the population.

Key Terms

Asthma was defined in this study as a chronic lung disease characterized by variable and recurring symptoms, airflow obstruction, bronchial hyperresponsiveness (bronchospasm), and an underlying inflammation. Asthma action plans are written plans developed by a child's caregivers with health care providers to help control the child's asthma. An asthma exacerbation is a worsening in symptoms; medically may refer to an increase in the severity of a disease or its signs and symptoms. For this study, asthma

friendly schools are aimed at improving quality of life, health outcomes and well being for school children with asthma. Asthma management is the act of learning to identify and avoid the things that trigger an asthma episode, and further education on medications and other asthma management strategies. Difficult or labored breathing or shortness of breath is defined as dyspnea. Middle schools were those schools in Texas offering sixth through eighth grades to eligible students. Each middle school was represented in a Regional Education Service Center Region (RES-C), which assists school districts in improving student performance and increasing the efficiency and effectiveness of school operation. Each region employs a School Health Specialist that has two primary roles; (a) to provide districts with professional development training, workshops, and technical assistance on health topics or legal issues and (b) to maintain an active network of agencies in both the public and private sector that provides support for the local district and regional health efforts. For this study, a school health professional is any professional involved in school health, including but not limited to school nurses, health educators, and counselors.

Variables in the study were identified as education, policy, perception, barriers and training. For this study, education includes continuing education on behalf of the School Health Specialists as well as education passed on to school health professionals within each RES-C. Policies entail but are not limited to safe school setting, identification of students with asthma, and the adoption of asthma management guidelines. Perceptions of the School Health Specialist regard asthma management practices that may include adolescent asthma management within their RES-C. Barriers include time, availability of education materials, student/parent compliance and lack of knowledge on the part of the

school staff. Training involves a school health professional's ability to identify and take the appropriate steps regarding asthma emergencies.

Theoretical Background

The Diffusion of Innovations Theory provided the theoretical framework for this research. The theory identifies and analyzes patterns of new ideas, or practice adopted by members of a social network (Rogers, 1995). The members of a social network, in this research were School Health Specialists. The innovation was training, education and policies of adolescent asthma management.

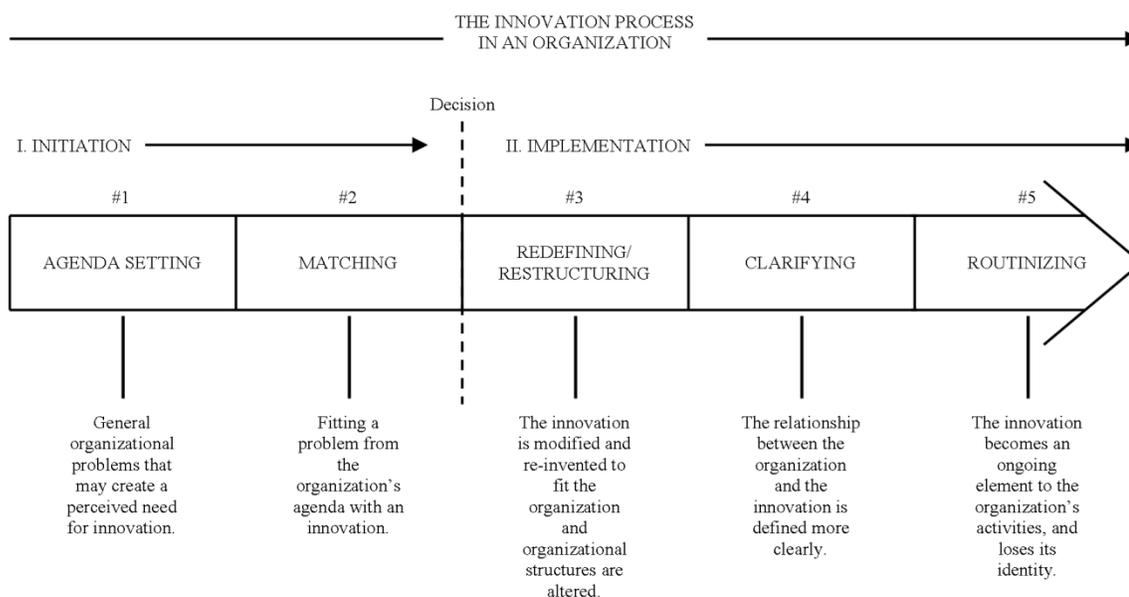


Figure 1. The Innovation Process in an Organization. Retrieved from “Five Stages in the Innovation Process in an Organization.” by Rogers, E.M., 1995, Diffusion of Innovations: Fourth Edition, p.392.

The Diffusion of Innovations Theory acts as a valuable tool for social change (Sharma, 2008). Rogers (1995) found that diffusion research revolves around conditions which increase or decrease the likelihood of the adoption of a new idea, product or

practice. Briefly, Rogers (1995) suggests the application of specific stages of diffusions as a requirement for the adoption to take place. Innovations are frequently adopted by individuals, however, many are adopted by organizations. In numerous cases, an individual cannot assume a new idea until an organization has previously adopted the innovation.

There are five stages in the Innovation Process in Organizations. The five stages include: agenda-setting, matching, redefining/restructuring, clarifying and routinizing. In the agenda-setting stage an agenda is triggered by both acknowledging the organizational problem and prioritizing them for solution, or awareness of the existence of a certain innovation. During the matching stage, an innovation is selected to match an issue or problem and is tried out by the organization. The organization molds the innovation to fit its objectives and structure as it redefines or restructures. The organization will then clarify as the fit is formalized between organization and innovation. Routinizing completes the stages as the innovation is incorporated into organizational routine. The initiation process encompasses agenda-setting and matching. This is followed by a decision being made. Redefining/restructuring, clarifying and routinizing are included in the implementation process (Rogers, 1995).

Table 1

Five Stages in the Innovation Process in an Organization in Relation to Asthma Management

Stage	Description	Application
Agenda Setting	The agenda is triggered by (1) acknowledging organizational problems and prioritizing them for solution or (2) awareness of the existence of a certain innovation.	Awareness/acknowledgement of underdeveloped asthma policies in schools.
Matching	An innovation is selected to match an issue or problem and is tried out by the organization.	Adopting “asthma-friendly” school recommendations.
Redefining or Restructuring	The organization molds the innovation to fit its objectives and structure.	Mold “asthma-friendly” recommendations to fit desired objectives.
Clarifying	The fit is formalized between organization and innovation.	Policies written and evaluated.
Routinizing	The innovation is incorporated into organizational routine.	Policies developed and implemented.

In reference to this study, the five states in the innovation process in an organization may be applied to School Health Specialists’ involvement (Table 1). As School Health Specialists’ approach the first stage, agenda setting, they expand their awareness and acknowledgment of underdeveloped asthma policies in their individual RESC’s. During the next stage, matching, School Health Specialists’ try out an innovation selected to match the asthma problem within middle schools in their RESC. For example, the adoption of

“asthma-friendly” school recommendations. Throughout the next stage, redefining or restructuring, School Health Specialists’ mold the “asthma-friendly” school recommendations to fit their desired objectives. Next, the School Health Specialists’ reaches the clarifying stage. Throughout the clarifying stage policies regarding asthma management are written and evaluated. The last stage, routinizing, requires the final development and implementation of policies within the School Health Specialists’ RESC.

Within the innovation process in an organization, members of a social network will individually adopt a new idea, product, or practice. Some School Health Specialists will adapt their perceptions regarding training, education and policies of adolescent asthma management more quickly than others. Rogers (1995) places those who adopt an innovation into five categories. These five categories are (1) innovators, (2) early adopter, (3) early majority, (4) late majority, and (5) laggards (Rogers, 1995). These categories follow a standard deviation-curve.

As School Health Specialists’ are faced with accepting changes in their asthma management policies, they are likely to go through the four steps in the Diffusion of Innovation Theory adoption process. The four steps an individual will encounter are knowledge, persuasion, decision and confirmation. Knowledge is the first step in the process of possible adaption. Knowledge is affected by receiver and social system variables. Receiver variables may include personality characteristics, social characteristics, and the perceived need for the innovation. Social system variables impact knowledge through social system norms, tolerance of deviancy and communication integration. Persuasion, the second step, is affected by individuals’ perceived characteristics of innovations. The perceived characteristics are relative advantage,

compatibility, complexity, triability, and observability. The decision step involves adoption or rejection. As an individual adopts the process there will be consequences. The individual will either continue the adoption process or discontinue the adoption through replacement and disenchantment. If the individual rejects the adoption process this will lead to a later adoption or continued rejection. The fourth and final step of the process is confirmation.

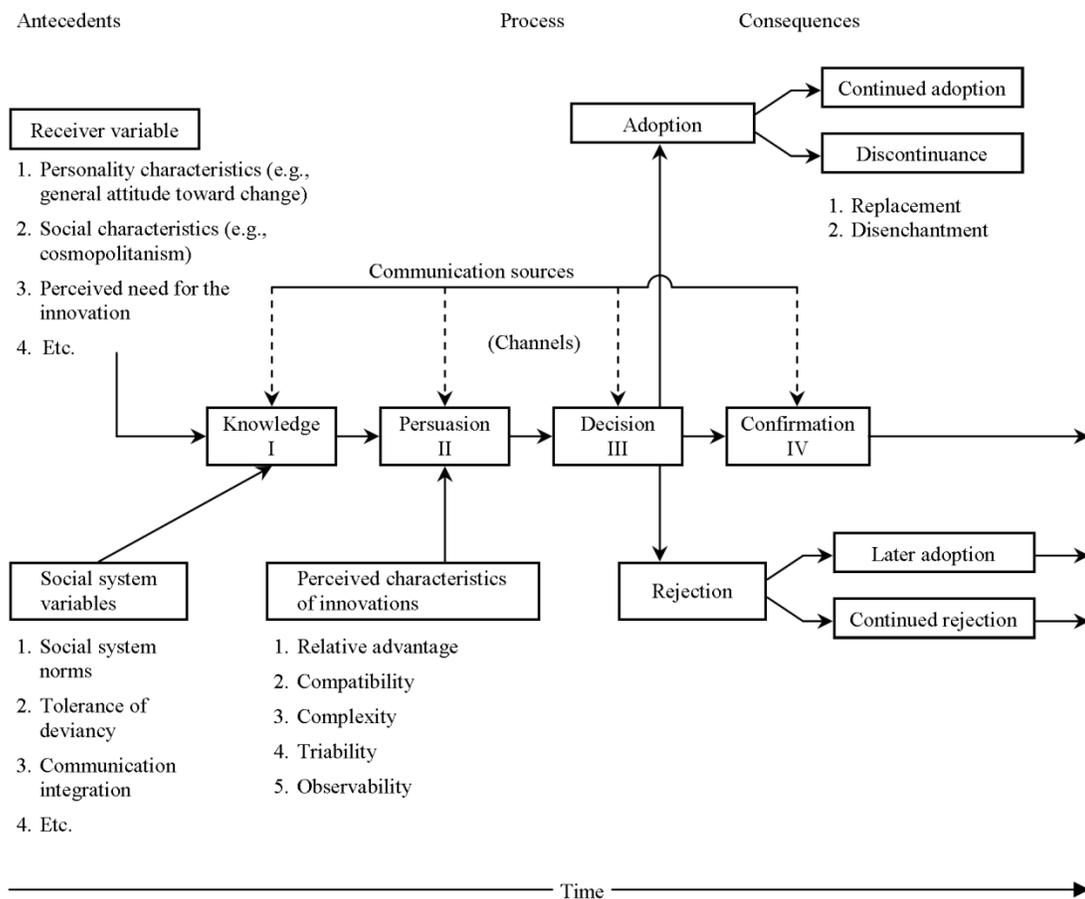


Figure 2. A Model of Stages in the Innovation- Decision Process. Adapted from “Five Stages in the Innovation Process in an Organization.” by Rogers, E.M., 1995, Diffusion of Innovations: Fourth Edition, p.392.

Research Design

This study employed a web-based survey design. An instrument to measure Texas School Health Specialists' perceptions regarding training, education and policies of adolescent asthma management was assembled and tested. Literature on adolescent asthma management, asthma policies, The Diffusion of Innovations Theory, along with a thorough evaluation of current asthma programs in middle schools informed the development of the instrument.

Each survey item was written to assess perceptions regarding training, education and policies of adolescent asthma management. The survey consisted of four questions regarding professional background, demographic location and recent participation in continuing education. Likert-scales were used for the remaining response options. A draft version of the survey was discussed with thesis committee members. Appropriate changes were made to the survey and a final instrument for the pilot study was created.

A pilot study, designed to test the questionnaire, was conducted with a random sample of Texas School Nurses. The school nurses names were collected from the Texas School Health Association (TSHA) directory. A survey, including an informational letter explaining the study and informed consent was emailed to participants. Observations guided appropriate changes for the development of the final instrument for Texas School Health Specialists.

Sample

The population of interest for this study was the School Health Specialist within the state of Texas. The sample for the final study was selected from the 2009-2010 Texas

Education Agency's directory of School Health Specialists. According to the Texas Department of State Health Services each Regional Education Service Center is employed with a Regional School Health Specialist. Some regions were identified with two representative School Health Specialists. The state of Texas is divided into twenty demographically different regions. Participants were selected using the Education Service Centers' current listing of School Health Specialist. All School Health Specialists receiving and completing the survey will be included in data analysis.

Data Collection

The sample was surveyed using a web-based survey with up to five contacts. Initially, an informational letter (Appendix A) and gift card were mailed to each Texas Regional School Health Specialist informing them of the upcoming web-based survey invitation. The invitation letter included the purpose of the study, the researcher's contact information, and prepared the participants for the upcoming web-based survey invitation. One week after the initial letters were sent, participants were sent an online survey link. Participants were asked to access the online survey link and follow the instructions to complete the online survey. The online survey cover page included additional survey information, information about confidentiality and contact information for the researcher. Participants were informed that by voluntarily participating in the online survey they were committing to informed consent. Weeks three and four consisted of a thank you letter sent to participating School Health Specialists and urged non-participants to complete the survey (Appendix B). Throughout the survey process, some participants experienced difficulties receiving the initial survey link. After communication with the participants an additional email including a survey link was sent.

The responses from participants were kept confidential. Responses were transmitted to SurveyMonkey and merged into SPSS (Statistical Package for the Social Sciences) for statistical analysis. By voluntarily participating and returning the survey, participants were committing to informed consent.

Analysis of Data

School Health Specialists' perceptions regarding the training, education and policies of adolescent asthma management were analyzed in this study using SPSS. The data for this study were analyzed through descriptive statistics, correlation techniques, and analysis of variance. Descriptive statistics were used to describe asthma management in Texas middle schools. Correlational techniques were used to study the relationships among variables and an ANOVA was used to compare the means for adolescent asthma management among demographic groups. Further discussion and results of data analysis for this study are presented in Chapter IV of this thesis.

CHAPTER II

LITERATURE REVIEW

Introduction

Asthma is a common chronic disease in the United States and efforts to improve care and control are of concern (Barholomew et al., 2006). Including adults, adolescents and children, asthma is currently impacting about 22 million Americans (National Heart, Lung, and Blood Institute [NHLBI], 2007). Within the state of Texas, 389,000 children are reported to have asthma (Asthma Coalition of Texas, 2007). The Asthma Coalition of Texas (2007) identified asthma as one of the most chronic lung diseases that continues to be a health concern in Texas.

Despite a growing concern regarding asthma's threat to public health in the United States, a majority of states, including Texas, do not have comprehensive data to determine asthma prevalence, causes, triggers, and prevention strategies (Bartholomew et al., 2006). The rate of near-fatal incidents peaks in 12-15 year olds, which are critical years for intellectual growth (Bruzzeze et al., 2004). Students would benefit from school-based promotion of asthma education by supporting students in the management of asthma through education, training and policy development.

Education

The value of each breath is understood and greatly appreciated after the diagnosis of asthma. Asthma is a chronic respiratory disease triggered by allergens, infections,

exercise, irritants, and various other exposures (NHLBI, 2007). Asthma affects the lungs as it causes the lower airways to become inflamed and swollen, and surrounding muscles to constrict (Asthma Coalition of Texas, 2007). Signs and symptoms may range from a minor cough, wheezing, or shortness of breath, to a severe asthma attack (NHLBI, 2007). Additionally, asthma is the leading cause of hospitalization in children and a major cause of school absenteeism (Bruzzese, Evans, & Kattan, 2009; Tinkelman & Schwartz, 2004). In 2003, the CDC found that children with at least one asthma attack in the preceding year were absent a cumulative total of 12.8 million school days due to asthma (Bruzzese et al., 2009). Although there is no cure for asthma, according to the NHLBI, it can be controlled with medication, management and education (2007).

Asthma education is an essential part of asthma management. Asthma education programs improve asthma outcomes such as asthma symptoms, frequency of attacks, absenteeism, and daily performance. Olajos-Clow, Costello, and Loughheed (2005) evaluated the impact of asthma education in a randomized control study. Results indicated statistically significant improvement in perceived control of asthma and improvement in quality of life after the completion of asthma education program was observed.

In particular, school-aged children can benefit from asthma education programs. Educators are often reminded of the correlation between child health and academic potential by health professionals (Taras & Potts-Datema, 2005). Numerous studies have found correlation between asthma management and high rates of missed school days (Moonie, Sterling, Figgs, & Castro, 2006; Moonie, Sterling, Figgs, & Castro, 2008; Taras & Potts-Datema, 2005). Moonie et al. (2006; 2008) suggested excess absenteeism

disturbs the process of learning. The disruption in learning has impacted test scores and classroom performance of asthmatic students. A study conducted by Monnie, et al. (2008) assessed the relationship between the presence of asthma and academic achievement in school-aged children. Conclusions included academic performance and absenteeism are strongly linked, students with asthma are absent more frequently than those without asthma, and asthma severity may be a large factor contributing to lower test score performance. Given that asthma influences proficiency testing, intervention approaches are required to correct this deficiency (2008).

Asthma education is important for youth of all ages, but the adolescent time period provides a unique opportunity for education. In comparison to children, adolescents are at a higher risk for the negative outcomes associated with asthma (Bruzze et al., 2004). The transition to adolescence engages stronger relationships with peers, changes in self-identity, more social networking, a growing variety of settings in which activities take place, and an increased likelihood of engaging in risk behaviors that may exacerbate asthma symptoms (Ayala et al., 2006). Adolescents experience more severe exacerbations requiring hospitalization, intubation, and cardiopulmonary resuscitation than children under the age of 11 years (Bruzze et al., 2004). These exacerbations have a greater likelihood of resulting in death. Regardless, there is a lack of programs suitable for adolescents. Evidence supports that adolescents are ready to take on the task of asthma management due to their development of cognitive skills and stage of psychosocial development (Bruzze et al., 2004).

Cognitive growth, autonomy, and peer relations developed during adolescence can be encouraged to help teens better manage their asthma. To begin with, cognitive

growth is crucial for effective asthma management. Throughout the adolescent period teens become more advanced in decision-making and evaluating long-term consequences (Twedell, 2003). These cognitive abilities allow adolescents to realize that asthma can be controlled and long-term goals regarding asthma can be overcome (Bruzese et al., 2004). The authors continue with autonomy as evolving as children move into their teen years. Youth spend more time away from caregivers and the home, resulting in more individual experiences and decision making. Growing autonomy allows teens to learn and make decisions empowering their disease management. Applying this to asthma education carries great importance as adolescents begin to understand asthma management and can be portrayed as a responsible individual. Last, peer relations are a critical development in the social development of adolescents. Peer relations become vital within the school setting and are even more important with adolescents with chronic illnesses. Bruzese et al. (2004) conclude that asthma education can grow with adolescents and peer relations by developing workshops and group events, reaching more asthmatic students in a shorter period of time.

In the appropriate environment, adolescents are prepared to take on the task of asthma management. The school setting is a target for asthma education because it offers unique opportunities to aid asthmatics who have not been diagnosed or who have poor control and limited access to medical care (Bartholomew et al., 2006). The types of education programs may vary in each location but the key to success is in the training of nurses, teachers, and other school health officials.

Training, Knowledge and Support for Asthma Management

Asthma is manageable but not preventable. Asthma is likely to be prevalent in the nation's schools making it necessary to examine the awareness of staff and educators in the care of children with asthma. It is important that school personnel are trained to assist in asthma management, considering the number of children with asthma and the momentous time they spend in school.

Studies indicate that the involvement of school nurses can make a difference (Bruzzese et al., 2009). Public schools often do not employ the proper number of nurses regardless of the growing number of asthma cases and the fact that teacher may not anticipate to have on average two children with asthma in their classroom during an academic year (Neuharth-Pritchett & Getch, 2001). The National Association of School Nurses' (NASN) position statement on the nurse to student ratio advocates that there should be one school nurse for every 750 students in the general school population (NASN, 2000). The School Health Policies and Programs Study of the Centers for Disease Control and Prevention conducted a survey on school nursing that reported alarming results. Despite NASN recommendations, the survey found that only 36% of schools had a registered or licensed practical nurse in the school greater than 30 hours per week (Bruzzese et al., 2009). According to the Texas Selected Topics Fact Sheet Profiles (2008), only 79% of schools in Texas have a full-time registered nurse who provides health services to students at school. As a consequence of the school nurse shortage, there is a greater need than ever for teachers and other school personnel to support with the management of children with asthma (Neuharth-Pritchett & Getch, 2001).

Students with asthma spend a majority of their week in school under the supervision of adults in the classroom, who may or may not be familiar with asthma management (Szeffler, 2009). Studies have indicated teachers and other paraprofessionals are implementing health care procedures, as well as administering medication in classrooms (Neuharth-Pritchett & Getch, 2001). However, these individuals often have inadequate training in regards to medical conditions, medication administration, and the possible side effects of medications. A case study in Ontario, Canada concluded in general, teachers did not know which students had asthma, and students with asthma were not allowed to carry emergency inhalers. The needs assessment also noted that 80% of teachers did not feel confident about their ability to handle worsening asthma in school (Cicutto et al., 2006). The CDC's selected topics fact sheet identified only 47% of school in Texas required all school staff members to receive annual training on recognizing and responding to severe asthma symptoms as well as only 57% of schools implementation policies permitting students to carry and self-administer asthma medications (CDC, 2008). Although asthma intervention and medication administration by the teacher is not specifically in the scope of their practice, it often falls in their hands because of the lack of nursing personnel in many schools (Neuharth-Pritchett & Getch, 2001).

With the responsibilities of asthma management and education becoming more dependent on school nurses and teachers, programs and school guidelines need to be set in order to lead to a safer and more successful outcome. A literature review conveyed that asthma education programs may contribute to preventing and managing asthma attacks, reducing medical costs for the treatment and care of asthma, and increasing children's responsibility for the management of their asthma (Neuharth-Pritchett & Getch, 2001).

Children with asthma, along with parents, school personnel, and health care professionals may unite their efforts leading to a positive impact on the management of asthma (Neuharth-Pritchett & Getch, 2001).

Policy Development

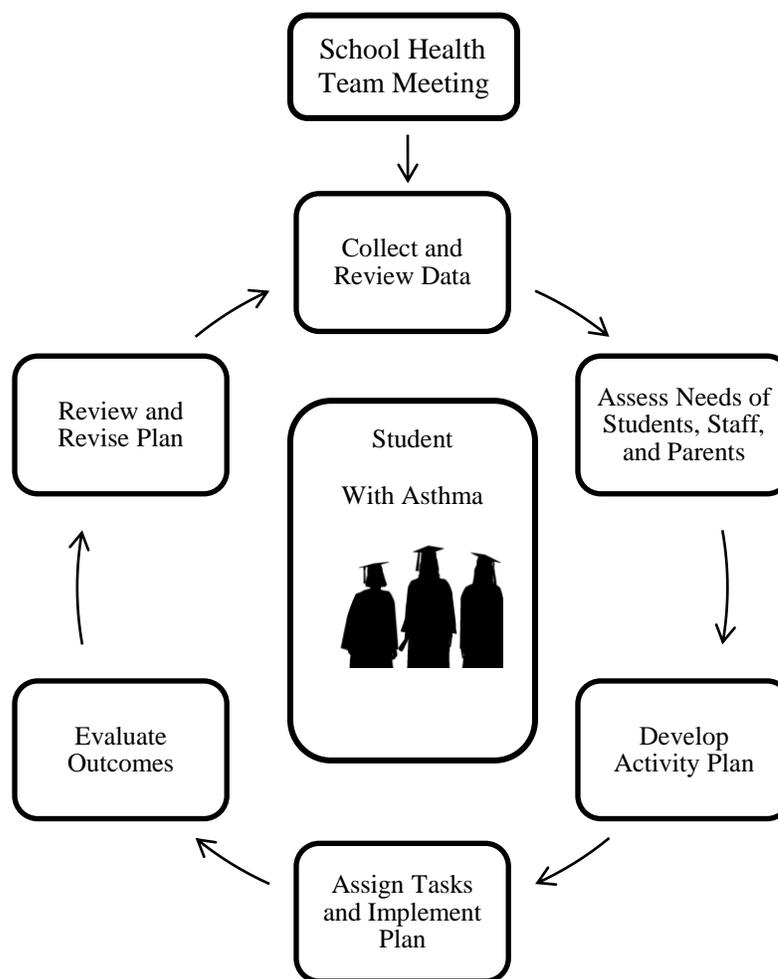
Maintaining and improving health has always been one of the schools most important functions (Merkle et al., 2006). Schools provide an excellent foundation to identify children with asthma, as well as educating them about their disease process and asthma management practices. Additionally, schools provide a logical environment to gather information about how children are managing their asthma (Tinkelman & Schwartz, 2004). Unfortunately, this cannot be done alone. There is a strong need for collaboration from the community and other health care resources. The school setting provides an optimal setting for collaboration to occur, “schools provide a setting for families, health care providers, universities, state and local health agencies, and community organizations, to work together to improve the health outcomes of children with asthma” (Merkle et al., 2006).

Lessons for improving the quality of school-based asthma management have emerged from the research and case study findings. As important programs are implemented in the school setting, key points should be remembered. The essential first step in education development and creating an asthma friendly environment is identifying a schools system’s needs, resources, and barriers (Wheeler et al., 2006). Bruzzese et al. (2009) delineate the steps for a needs assessment based on improving school absenteeism and nursing care, while Circutto, et al. (2006) describe the needs and opportunities for school personnel to achieve a better understanding of asthma-related issues. Each school

should strive to develop their assessment, leading to the execution of their individual needs.

The development of an asthma program is an important step to gain and to build administrative support and to establish strong links to asthma care clinicians. Tailoring messages to make a clear connection between asthma programs, school improvement, and students' achievements specific to each schools needs is vital for this connection (Langenfeld, Bonaiuto, & Edmonds, 2006). In a North Carolina school district the Asthma Education Program (AEP) staff met with school principles and presented their individual asthma profiles based on data provided by school health providers (Langenfeld et al., 2006). Data included profiles of asthmatic students, statistics on missed school days, and the issues raised on safety and medication availability (Langenfeld et al., 2006). These types of data driven discussions provide the opportunity for school officials to understand the needs of the students, staff and parents prior to developing an activity plan.

Figure 3 provides an example of the steps followed by the AEP program. After the school health team has met, they can begin the steps of collecting and reviewing data. The data will assess the needs of students, staff and parents. Carrying out a needs assessment will further develop the plan of action. After the activity plan has been implimented an evaluation can occur. Finally, the plan is reviewed and revised. The steps in developing a school wide asthma activity plan will provide a safe and healty environment for students with asthma.



*Figure 3. School Health Team Steps in Developing a School Wide Asthma Activity Plan. Adapted from “Garnering Administrative Support for School-Based Asthma Education Programs,” by Langenfeld, N.A., Bonaiuto, M.M., & Edmonds, E.O., 2006, *Journal of School Health*, 76, p.251.*

Many school-based asthma programs are missing the appropriate medical care (Wheeler et al., 2006). Programs that either offer asthma care directly or guarantee adequate communication between the school and an asthma care clinician have successfully lowered asthma morbidity (Bruzzese et al., 2006; Byrne, Schreiber, & Nguyen, 2006; Wheeler et al., 2006). However, ensuring adequate medical coverage is

difficult for many school-based asthma programs, particularly in areas with a low socioeconomic status and areas with poor family support (Wheeler et al., 2006). The development of asthma programs should include strategies that accomplish stronger links with health care providers including school nurses, community asthma care clinicians, hospitals or School Health Specialist (Byrne et al., 2006; Wheeler et al., 2006).

Upon the completion of a needs assessment and the collaboration of a multi-disciplinary team, school representatives may opt to look into resources that are provided for the development of asthma programs. Local, state, and national agencies have developed detailed guidelines geared toward the improvement asthma management.

Conclusion

Schools provide an excellent foundation to educate students about their disease process and asthma management practices. A wealth of literature is available to those searching for school-based asthma guidelines and methods of improvement. Asthma education programs improve asthma outcomes in terms of asthma symptoms, frequency of attacks, absenteeism, and daily performance (Olajos-Clow et al., 2005). Whether by the school nurse, school health specialist, teacher or administrator, an initiative should be taken to improve the asthma management, education, and policies in the school environment.

CHAPTER III

METHODOLOGY

The purpose of this study was to examine Texas Regional Education Service Center School Health Specialists' perceptions regarding the training, education and policies of adolescent asthma management. It was reviewed by the Institutional Review Board at Texas State University (Appendix C).

Assessment

The results from this study provide baseline data which can be used to understand the knowledge and perceptions regarding the training, education and policies of adolescent asthma management. The data collected from this study provides an in-depth perspective from the group of School Health Specialists in Texas Regional Education Service Centers. A web-based survey instrument was used to collect data. The request to complete the survey was sent to School Health Specialists in each of the Texas Regional Education Service Centers using the email addresses provided by the Texas Education Agency (TEA) website.

Asthma is a common chronic illness affecting adolescents nationwide. The school setting provides an excellent opportunity to assess the asthma management of adolescents. Each School Health Specialist provided insight to the training, education and

policies in adolescent asthma management from the school standpoint. Additionally, this study promotes evidence on school-based asthma education to other facilities outside the state of Texas.

Design

This study employed a web-based survey design using SurveyMonkey, consisting of 37 questions regarding adolescent asthma management. An instrument to measure Texas School Health Specialists' perceptions regarding the training, education and policies of adolescent asthma management was assembled and tested. The survey was a new tool developed by incorporating a variety of question from previous instruments (ALA, 2007), prior knowledge and the literature. A pilot study to test the survey was conducted with a random sample of Texas School Nurses collected from the TSHA directory.

Subject Selection

The population of interest for this study was the School Health Specialist within the state of Texas. The sample for the final study was selected from the 2009-2010 Texas Education Agencies' directory of School Health Specialists. According to the Texas Department of State Health Services, each Regional Education Service Center is employed with a Regional School Health Specialist. Some regions were identified with two representative School Health Specialists.

The state of Texas is divided into twenty demographically different regions. The differences in demographic characteristics of school type, area, geographical location, and school enrollment were established by the Texas Department of State Health

Services. The representative School Health Specialist was invited to participate in a survey assessing the training, education and policies in adolescent asthma management. Participants were selected using the Education Service Centers' current listing of School Health Specialist. All School Health Specialists receiving and completing the survey will be included in data analysis. IRB approval was obtained for this study on December 10, 2009 (2009U5654).

Instrument and Variables

Findings from a review of literature and the Diffusion of Innovations for Organizations Theory provided direction in the development of this study's instrument design. The survey tool was developed using a thorough review of the literature and focused on obtaining a greater understanding of the professional training, education and policies of adolescent management in Texas middle schools.

The instrument, a web-based survey, was designed to be short, to help increase the response rate. The online survey contained a total of 37 questions based on a review of literature and the research questions developed. The survey began with four questions dichotomous questions regarding professional background, demographic location and recent participation in continuing education. Two of the total survey questions were focused on understanding the School Health Specialists training involving asthma. They were followed by six questions regarding the School Health Specialists education in adolescent asthma management. Fourteen questions were included to understand the School Health Specialists understanding of policies regarding adolescent asthma management within their Regional Education Service Center. There were six questions

regarding the School Health Specialist perceptions involving asthma management. Finally, the survey included five question regarding barriers faced in asthma management. The survey was expected to take 15-20 minutes to complete.

Four questions related to participant demographics began the survey, followed by thirty-three questions using a four-point strongly agree-strongly disagree Likert scale. Questions were designed to measure perceptions regarding the training, education and policies of adolescent asthma management in Texas Middle Schools. A copy of the final instrument is found in Appendix D.

The Diffusion of Innovations Theory acts as a valuable tool for social change (Sharma, 2008). Diffusion research revolves around conditions which increase or decrease the likelihood of the adoption of a new idea, product, or practice (Rogers, 1995). The theory identifies and analyzes patterns of new ideas, or practice adopted by members of a social network (Rogers, 1995). According to Rogers (1995), the Diffusion of Innovations Theory suggests that the social structure helps set the degree of the diffusion.

Pilot Testing

An instrument measuring descriptive statistics was developed and employed through the survey instrument. The graduate thesis committee reviewed the questions for content validity. Their comments were taken into consideration throughout the survey development process. A pilot test group was comprised to strengthen our research outcomes. Texas school nurses were randomly selected from the TSHA directory and used as the pilot group. Due to similar health knowledge and maintaining our small sample size, forty nurses were selected.

A survey (Appendix D), including an informational letter (Appendix A) explaining the study and informed consent (Appendix E) was emailed to participants. A reminder survey link was sent to participants five days after the initial survey was sent. Final communication was emailed ten days after the initial survey and urged non-participants to complete the survey. Participants were asked to comment on any difficulties while reading the survey or comprehending the survey questions. Face validity was checked during the administration pilot to ensure that the questions were interpreted with the same meaning as intended. The pilot test groups' observations were taken into consideration and necessary changes were made. All items for the pilot study were reviewed and approved by the Institutional Review Board at Texas State University-San Marcos (Appendix C).

There was a 38% response rate for the pilot study (Table 2). Fifteen school nurses participated in the online survey. Only ten school nurses responded to the question regarding demographic location; rural or urban. Five were located in rural areas and five were located in urban areas. Nine responded to participation in continuing education related to asthma in the last 12 months; five said yes and four said no.

During the pilot study an error regarding the demographic location question was identified. Participants were originally asked to identify rural or urban; yes or no. The question was changed to ask participants if they were located in a rural or urban area with rural and urban identified as the possible answers. The question was corrected prior to disseminating the final web-based survey to the research participants.

Table 2

Pilot Study Demographics

Variable	N	%
School Nurses		
Invited to Survey	40	100%
Participated in Survey	15	38%
Demographics		
Rural	5	50%
Urban	5	50%
Professional Background		
Health Education	0	0%
Nursing	10	100%
Counseling/Mental Health	0	0%
Social Work	0	0%
Nutrition	0	0%
Physical Education	0	0%
Other	0	0%
Participation in Continuing Education Related to Asthma in the last 12 Months		
Yes	5	55.6%
No	4	44.4%

Note. A total of 15 school nurses participated in the pilot study. Five participants skipped the questions regarding demographics and professional background. Six participants skipped the question regarding recent continuing education related to asthma.

Data Collection

School Health Specialists were the population of interest for this study. The sample for the final data collection was selected from the 2009-2010 Texas Regional Service Center's directory of School Health Specialists. A sample of School Health Specialists (N=22) was selected (Table 3).

An informational letter (Appendix A) and gift card was mailed to each Texas Regional School Health Specialist informing them of the upcoming web-based survey invitation. The gift cards were included as an incentive to participate in the survey,

however, participants were informed their participations was strictly voluntary. Texas is divided into twenty regions; the sample consisted of twenty-two participants.

The data collection process extended over a four week period. During week one, an initial informational letter (Appendix A) and gift card was mailed to all qualifying participants. The invitation letter included the purpose of the study, the researcher's contact information, and prepared the participants for the upcoming web-based survey invitation. One week after the initial letters were sent, participants were sent an email containing an online survey link. Participants were asked to access the online survey link and follow the instructions to complete the online survey. The online survey cover page included additional survey information, information about confidentiality and contact information for the researcher. Participants were informed that by voluntarily participating in the online survey they were committing to informed consent. Weeks three and four consisted of a thank you letter sent to participating School Health Specialists and urged non-participants to complete the survey (Appendix B). Throughout the survey process, some participants experienced difficulties receiving the initial survey link. After communication with the participants an additional email including a survey link was sent. The responses from participants were kept confidential. Responses were transmitted to SurveyMonkey and merged into SPSS for statistical analysis.

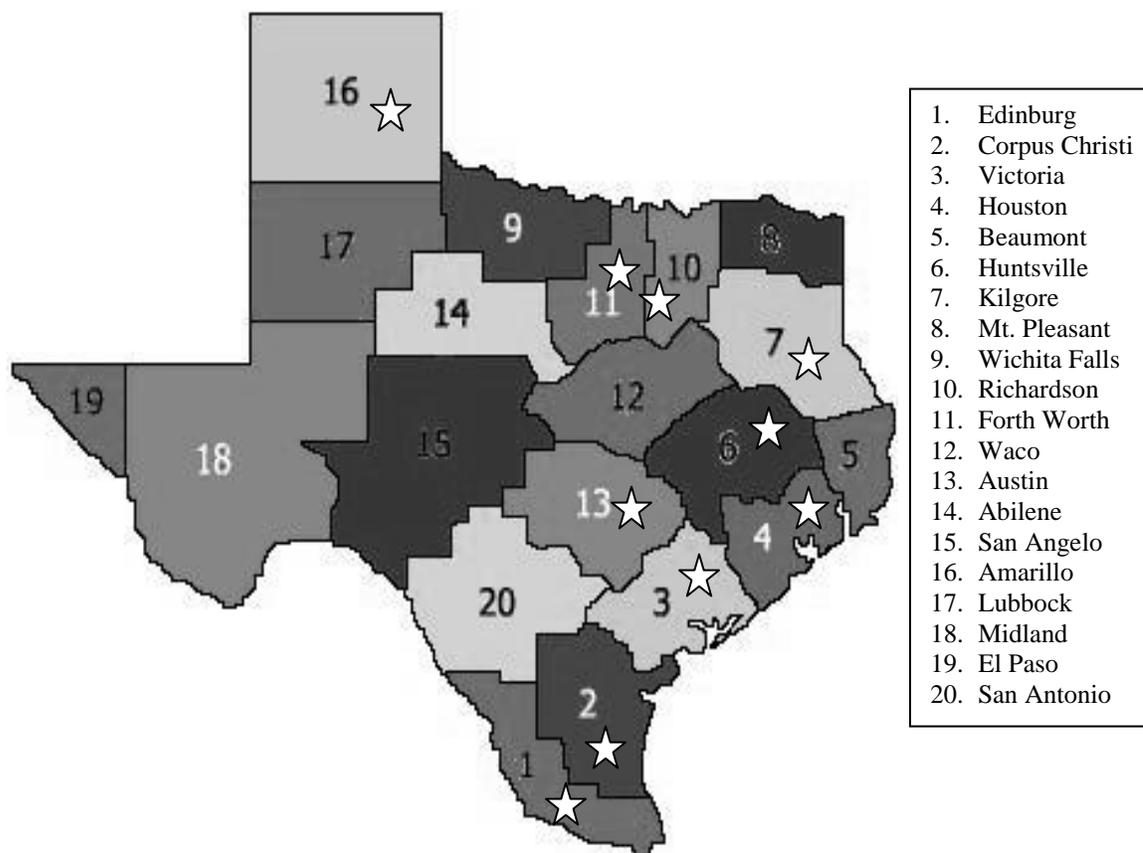
Table 3

*Texas Education Agency Regional Education Service Centers (RESCs)
Involved in Survey Analysis*

Region	Number of School Health Professionals N (%)	Sent Survey Link
I	1 (0.045%)	1
II	1 (0.045%)	1
III	1 (0.045%)	1
IV	1 (0.045%)	1
V	1 (0.045%)	1
VI	2 (0.090%)	2
VII	1 (0.045%)	1
VIII	1 (0.045%)	1
VIV	1 (0.045%)	1
X	1 (0.045%)	1
XI	1 (0.045%)	1
XII	1 (0.045%)	1
XIII	2 (0.090%)	2
XIV	1 (0.045%)	1
XV	1 (0.045%)	1
XVI	1 (0.045%)	1
XVII	1 (0.045%)	1
XVIII	1 (0.045%)	1
XVIV	1 (0.045%)	1
XX	1 (0.045%)	1
Total	22 (100%)	22

After five possible contacts with School Health Specialists a 68% response rate was obtained. The researcher tried to assure that all surveys were delivered to the School Health Specialists. Some School Health Specialists declined to participate in the study

Table 4

Regions Identified With Survey Response

Note. Some regions were unable to be identified. Only 10 of the 15 regions are represented in the table above.

Analysis of Data

School Health Specialists' perceptions regarding training, education and polices of adolescent asthma management were analyzed quantitatively in this study.

Quantitative data were collected in preparation for analysis and to document prevalence

(Bowling, 2002). Descriptive statistics for the selected variables in this study were produced SPSS (Statistical Package for the Social Sciences Version 18).

Survey Monkey, the online survey program, automatically transferred the data of each participant into a Microsoft Excel spreadsheet and then the data were merged into SPSS. The data for this study were analyzed through descriptive statistics, correlation techniques, and analysis of variance.

Descriptive statistics summarize, organize and in general, describe quantitative data (Vogt, 1999). In this study, descriptive statistics were used to describe asthma management in Texas middle schools in a meaningful manner so that the underlying information could be easily understood.

Correlation is the extent to which two or more things are related (Vogt, 1999). Correlational techniques were utilized to study the relationships among variables in this study. A correlation coefficient, a number ranging from -1.0 to + 1.0, was used to show the degree to which two variables were related (Vogt, 1999).

Analysis of Variance (ANOVA) is one of the most powerful methods for comparing means if two or more groups are involved (Neutens & Robinson, 2002). In analysis of variance, a ratio of observed differences is used to test hypotheses (Neutens & Robinson, 2002). Several one-way ANOVA's were used to compare the means for adolescent asthma management among demographic groups. Asthma management variables included education, policy, perception, barriers and training. An F value substantially greater than one, shows the true difference is likely to result of the treatment (Neutens & Robinson, 2002). Results indicate a significant difference for education,

with those who participated in continuing education related to adolescent asthma management over the last 12 months scoring higher than those who didn't. Further discussion and results of data analysis for this study are presented in Chapter IV of this thesis.

CHAPTER IV

RESULTS

Introduction

This study was designed to examine the perceptions regarding training, involvement and policies of adolescent asthma management from the perspectives of School Health Specialists in the Texas Regional Education Service Center. The School Health Specialists perceptions and attitudes of barriers in asthma education were proposed as observed variables. Data were analyzed using descriptive statistics, correlational techniques and ANOVA. Descriptive statistics were used to describe asthma management in Texas middle schools. Correlational techniques were used to study the relationships among variables. An ANOVA was used to compare the means for adolescent asthma management among demographic groups.

Sample

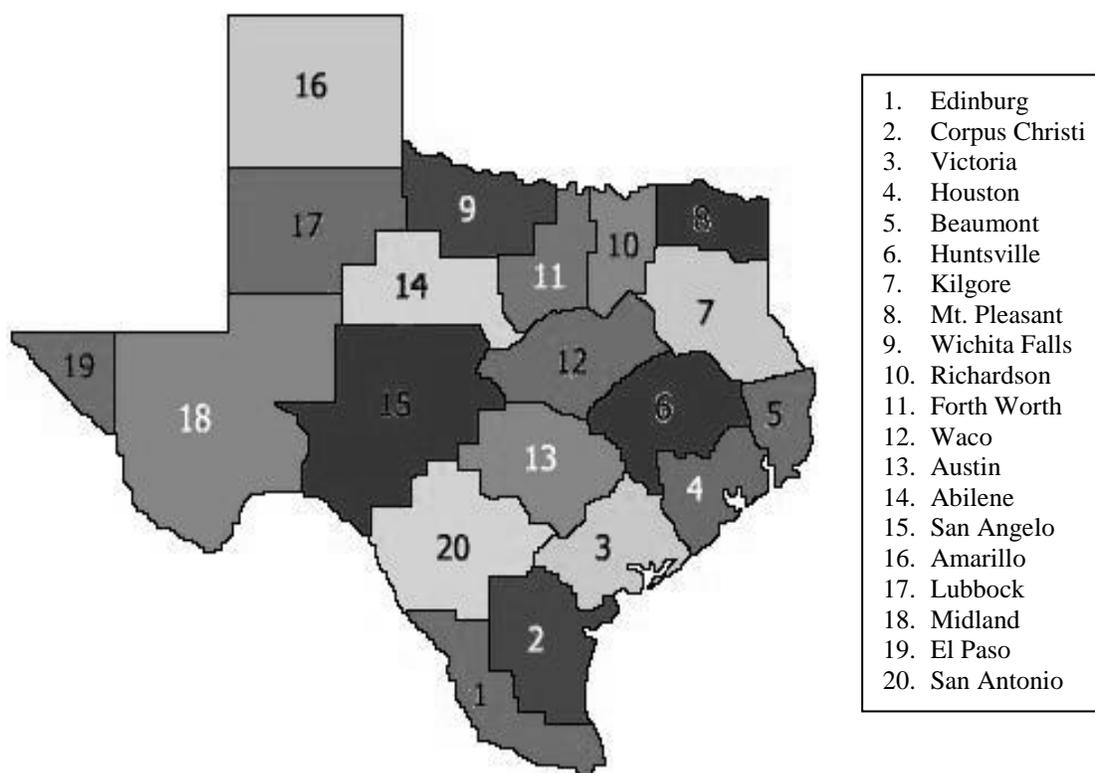
The population of interest for this study was the School Health Specialist within the state of Texas. The sample for the final study was selected from the 2009-2010 Texas Education Agencies' directory of School Health Specialists. According to the Texas Department of State Health Services, each Regional Education Service Center is employed with a Regional School Health Specialist. Some regions were identified with two representative School Health Specialists. The state of Texas is divided into twenty demographically different regions (Table 5). Participants were selected using the

Education Service Centers' current listing of School Health Specialists. The data from all School Health Specialists that received and completed the survey were included in data analysis.

The study's sample size of 15 reached statistical representation for the population of School Health Specialists in Texas. A response rate of 68% was obtained. The response rate from each region ranged 0% to 100%.

Table 5

Texas Regional Education Service Centers (RES-C)



Note. Texas Regional Education Service Centers (RES-C). Retrieved from <http://ritter.tea.state.tx.us/ESC/>.

Instrumentation

Data were collected using a survey instrument developed using previous knowledge and a thorough review of the literature related to adolescent asthma management. The instrument contained items describing education (6), policy (14), perception (6), barriers (5) and training (2) involved in adolescent asthma management. The instrument was reviewed and tested during a pilot survey. Education, policy, perception, barriers and training scores ranged from 6-24, 14-56, 6-24, 5-20, and 2-8, respectively. Four demographic items were included in the survey instrument.

Missing Data

Due to the limitations in sample size, any questionnaires that were incomplete were not deleted from the study. Because the missing data were few and seemed to not affect the results, items with missing data were left as “missing”.

Sample Characteristics

A total of 22 respondents were asked to participate in the survey. Fifteen respondents from the final study were included in the data analysis, yielding a final participation percentage of 68%. Participants responded from both rural and urban areas. There were 8 (57%) rural and 6 (43%) urban participants within the final study (Table 6).

Table 6 also shows the respondents' identified professional background. One-third (33%) of the respondents identified another professional background than provided in the study. School Health Specialists who selected nursing (25%, n=3) represented the next highest professional background. A professional background in health education followed (17%, n=2). Counseling/mental health, social work, and physical education each

represented 8% of the population. Three participants skipped the question regarding professional background. School Health Specialists' were also asked about their participation in continuing education related to asthma (Table 6). Seventy-three percent of the School Health Specialists reported participation in continuing education related to asthma in the last 12 months, whereas, 26% (n=4) of School Health Specialist did not.

Table 6

Survey Demographics

Variable	N	%
School Health Specialists Invited to Survey	22	
Participated in Survey	15	68%
Demographic Location		
Rural	8	57%
Urban	6	43%
Professional Background		
Health Education	2	17%
Nursing	3	25%
Counseling/Mental Health	1	8%
Social Work	1	8%
Nutrition	0	0%
Physical Education	1	8%
Other	4	33%
Participation in Continuing Education Related to Asthma in the last 12 Months		
Yes	11	73.3%
No	4	26.7%

Note. A total of 15 School Health Specialists participated in the final study. Three participants skipped the questions regarding demographics and professional background.

Descriptive Statistics

Tables 7 through 11 provide descriptive statistics for each scales' designated items. The tables show the frequencies of the responses from the sample of School Health Specialists. The mean and standard deviation are also reported.

Items on the survey were grouped together in order to create a scaled variable. Questions 12, 16, 17, 19, 20 and 26 shown in table 7 assessed the perceptions involved in adolescent asthma management. The training involved in adolescent asthma management was evaluated in questions 31 and 32 (Table 8). Questions 5- 8, 10 and 11 shown in table 9 regarded the education involved in adolescent asthma management. Table 10 discussed the policies involved in adolescent asthma management through questions 9, 13- 15, 18, 27- 29, and 33- 37. Lastly, table 11 included questions numbers 21-25, entailing the barriers in adolescent asthma management.

Information presented in table 7 provides an overview of questions regarding perceptions involved in adolescent asthma management. A majority of respondents agreed with the perceptions identified in the study. Fifty five percent of School Health Specialists felt that asthma is a significant problem within middle schools in their RESC. Asthma education within the school setting was identified as important for an asthmatic student's health (67%). School Health Specialist also agreed that school health professional within their RESC would benefit from asthma training (73%) although time demands are paperwork are cause for lack of asthma management and education (60%). The means for questions regarding perceptions ranged from 2.07 to 3.33 and the standard deviation was found to be between .457 and .730.

Table 7

Distribution of Mean Scores for Texas School Health Specialist Regarding their Perceptions Involved in Adolescent Asthma Management

Question	Mean	SD	Strongly Agree N/(%)	Agree N/(%)	Disagree N/(%)	Strongly Disagree N/(%)	Total N
12. School health professionals in your RESC would benefit from asthma training.	3.27	.458	4 (27%)	11 (73%)	0 (0%)	0 (0%)	15
16. Asthma education within the school setting is important for an asthmatic student's health.	3.33	.488	5 (33%)	10 (67%)	0 (0%)	0 (0%)	15
17. Asthma is a significant problem within middle schools in your RESC.	2.91	.701	2 (18%)	6 (55%)	3 (27%)	0 (0%)	11
19. Middle schools within your RESC have adequate nursing support.	2.07	.730	0 (0%)	4 (29%)	7 (50%)	3 (21%)	14
20. Time demands and paperwork are a cause for lack of asthma management and education.	2.80	.632	1 (10%)	6 (60%)	3 (30%)	0 (0%)	10
26. Asthma management is recognized by school health professionals within my RESC as a possible way to improve attendance.	2.83	.577	1 (8%)	8 (67%)	3 (25%)	0 (0%)	12

A majority of School Health Specialists agreed that training is relative in middle schools within their RESC, and this is presented in table 8. First, 67% of respondents agreed that school health professionals with student contact are trained to identify asthma emergencies within their RESC. At least 69% of School Health Specialist also agreed that school health professionals with student contact are trained to learn the appropriate steps to take in an asthma emergency. Up to 25% of respondents disagreed with school health professionals training regarding asthma emergencies within their RESC (Mean=2.85-2.93 and SD=.555-.557).

Table 9 shows that the majority of School Health Specialists agree with the education involved in adolescent asthma management. First, 67% to 85% of respondents have partnerships concerning asthma management and education and are confident that school health professionals in their RESC have current knowledge regarding asthma treatment and prevention, and that the knowledge is sufficient. A majority of School Health Specialists also disagreed with their involvement in current updates regarding asthma medication (47%) and national guidelines for asthma management (53%). The means for questions regarding education ranged from 2.20 to 3.08 and the standard deviation was found to be between .408 and .883.

Table 8

Distribution of Mean Scores for Texas School Health Specialist Regarding the Training Involved in Adolescent Asthma Management

Question	Mean	SD	Strongly Agree N/(%)	Agree N/(%)	Disagree N/(%)	Strongly Disagree N/(%)	Total N
31. School health professionals with student contact are trained to identify asthma emergencies within my RESC.	2.93	.557	1 (8%)	8 (67%)	3 (25%)	0 (0%)	12
32. School health professionals with student contact are trained to learn the appropriate steps to take in asthma emergencies within my RESC.	2.85	.555	1 (7%)	9 (69%)	3 (23%)	0 (0%)	13

Table 9

Distribution of Mean Scores for Texas School Health Specialist Regarding the Education Involved in Adolescent Asthma Management

Question	Mean	SD	Strongly Agree N/(%)	Agree N/(%)	Disagree N/(%)	Strongly Disagree N/(%)	Total N
5. In the last 12 months my Regional Education Service Center (RESC) participated in continuing education related to asthma.	2.73	.883	3 (20%)	6 (40%)	5 (33%)	1 (7%)	15
6. Schools in my RESC have partnerships with area clinics or providers concerning asthma management and education.	2.93	.593	2 (13%)	10 (67%)	3 (20%)	0 (0%)	15
7. I stay current with asthma medication purposes and updates.	2.33	.816	1 (7%)	5 (33%)	7 (47%)	2 (13%)	15
8. I stay current with national guidelines for asthma management.	2.20	.676	0 (0%)	5 (33%)	8 (53%)	2 (13%)	15
10. How confident are you that school health professionals in your RESC have <i>current</i> knowledge to treat and prevent asthma episodes for middle school students at their schools?	3.00	.408	1 (8%)	11 (85%)	1 (0%)	0 (8%)	13

Table 9 continued

Distribution of Mean Scores for Texas School Health Specialist Regarding the Education Involved in Adolescent Asthma Management

11. How confident are you that school health professionals in your RESC have <i>sufficient</i> knowledge to treat and prevent asthma episodes for middle school students at their schools?	3.08	.494	2 (15%)	10 (77%)	1 (8%)	0 (0%)	13
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Table 10 shows the respondent's perceived policy of adolescent asthma management. Over one-half of the respondents agreed that their RESC and school health professionals were adopting asthma management practices within the middle schools and are trained to identify asthma symptoms. At least 50% of School Health Specialist agreed that middle schools are working to reduce or eliminate allergens and irritants that can make asthma worse. However, approximately 58% of School Health Specialists disagreed that middle school students are provided with asthma education and 50% disagreed that school health professionals monitor information regarding absences related to asthma. Many, (77%) still felt that schools within their RESC provide or have models for written asthma actions plans for each child in case of a severe asthma episode. The means for questions regarding policies ranged from 2.42 to 3.30 and the standard deviation was found to be between .277 and .689.

The identification of barriers as a hindrance to asthma management was an additional finding during the study. Between 64% and 82% of School Health Specialists agreed that barriers are involved in adolescent asthma management (Table 11). School Health Specialists found time (75%), availability of education materials (64%), student compliance (82%), parent compliance (77%) and lack of knowledge on the part of school staff as barriers to asthma management (75%). However, 15% to 18% of respondents disagreed in barriers present involving time, student/parent compliance and lack of school staff knowledge. The means for questions regarding barriers ranged from 2.08 to 2.36 and the standard deviation was found to be between .405 and .515.

Table 10

Distribution of Mean Scores for Texas School Health Specialist Regarding the Policies Involved in Adolescent Asthma Management

Question	Mean	SD	Strongly Agree N/(%)	Agree N/(%)	Disagree N/(%)	Strongly Disagree N/(%)	Total N
9. The asthma management practices at schools within my RESC are consistent with recognized standards and guidelines.	2.92	.277	0 (0%)	12 (92%)	1 (8%)	0 (0%)	13
13. Schools within your RESC are “asthma-friendly.”	2.92	.515	1 (8%)	9 (75%)	2 (17%)	0 (0%)	12
14. School health professionals in your RESC educate parents and/or guardians about their student’s asthma management.	2.69	.630	1 (8%)	7 (54%)	5 (38%)	0 (0%)	13
15. Middle school students are provided with asthma education at schools within your RESC.	2.42	.515	0 (0%)	5 (42%)	7 (58%)	0 (0%)	12
18. Asthmatic students are identified by schools in your RESC.	3.00	.426	1 (8%)	10 (83%)	1 (8%)	0 (0%)	12

Table 10 continued

Distribution of Mean Scores for Texas School Health Specialist Regarding the Policies Involved in Adolescent Asthma Management

27. Middle schools within my ESCR have adopted policies to address asthma and asthma management.	2.82	.603	1 (0.08%)	8 (0.67%)	3 (0.025%)	0 (0.0%)	12
28. At least one school health professional monitors information about absences of children with asthma in middle schools within my RESC.	2.30	.675	0 (0.0%)	4 (0.40%)	5 (0.50%)	1 (0.10%)	10
29. At least one school health professional reports concern about attendance to appropriate personnel or counselors in middle schools within my RESC.	2.58	.515	0 (0.0%)	7 (0.58%)	5 (0.42%)	0 (0.0%)	12
30. School health professionals with student contact are trained to identify asthma symptoms within my RESC.	2.92	.515	1 (0.08%)	9 (0.75%)	2 (0.17%)	0 (0.0%)	12
33. Middle schools within your RESC promote staff awareness of health and wellness through presentations by health professionals, health fairs, or other in-service activities.	2.93	.475	1 (0.07%)	11 (0.79%)	2 (0.14%)	0 (0.0%)	14

Table 10 continued

Distribution of Mean Scores for Texas School Health Specialist Regarding the Policies Involved in Adolescent Asthma Management

34. Middle schools within your RESC reduce or eliminate allergens and irritants that can make asthma worse.	2.50	.522	0 (0.0%)	6 (0.50%)	6 (0.50%)	0 (0.0%)	12
35. My RESC has a written policy that allows adolescence to take asthma medications as prescribed by their doctor and permitted by parent at school.	3.00	.408	1 (0.08%)	11 (0.85%)	1 (0.08%)	0 (0.0%)	13
36. Middle schools within your RESC have a written asthma action plan for each child with asthma in case of a severe asthma episode.	2.92	.494	1 (0.08%)	10 (0.77%)	2 (0.15%)	0 (0.0%)	13
37. My RESC has a model for a written asthma action plan for children with asthma in case of a severe asthma episode.	2.85	.689	2 (0.15%)	7 (0.54%)	4 (0.31%)	0 (0.0%)	13

Table 11

Distribution of Mean Scores for Texas School Health Specialist Regarding the Barriers Involved in Adolescent Asthma Management

Question	Mean	SD	Strongly Agree N/(%)	Agree N/(%)	Disagree N/(%)	Strongly Disagree N/(%)	Total N
21. Time is a barrier to management of asthma in the school setting.	2.08	.515	1 (8%)	9 (75%)	2 (17%)	0 (0%)	12
22. Availability of education materials are a barrier to management of asthma in the school setting.	2.36	.497	0 (0%)	9 (64%)	5 (36%)	0 (0%)	14
23. Student compliance is a barrier to management of asthma in the school setting.	2.18	.405	0 (0%)	9 (82%)	2 (18%)	0 (0%)	11
24. Parent compliance is a barrier to management of asthma in the school setting.	2.08	.494	1 (0%)	10 (77%)	2 (15%)	0 (0%)	13
25. Lack of knowledge on the part of school staff is a barrier to management of asthma in the school setting.	2.08	.515	1 (8%)	9 (75%)	2 (17%)	0 (0%)	12

Correlation

Correlations were performed to analyze the data, and search for predictive associations. Table 12 shows the perceived characteristics related to adolescent asthma management. Although not statistically significant, a practical significance was found between education and barriers, as well as policy and barriers. A practical significance implies research results have importance on a more realistic level.

Table 12

Correlations Among Perceived Characteristics Related to Adolescent Asthma Management

		Education	Policy	Perception	Barriers	Training
education	Pearson Correlation	1	.315	.451	.740	.330
	Sig. (2-tailed)		.409	.191	.036	.295
	N	13	9	10	8	12
policy	Pearson Correlation	.315	1	.379	.627	-.189
	Sig. (2-tailed)	.409		.314	.131	.626
	N	9	9	9	7	9
perception	Pearson Correlation	.451	.379	1	.213	.503
	Sig. (2-tailed)	.191	.314		.612	.138
	N	10	9	10	8	10
barriers	Pearson Correlation	.740	.627	.213	1	-.361
	Sig. (2-tailed)	.036	.131	.612		.379
	N	8	7	8	8	8
training	Pearson Correlation	.330	-.189	.503	-.361	1
	Sig. (2-tailed)	.295	.138	.138	.379	
	N	12	10	10	8	12

A higher score in barriers indicated a greater likelihood of obstacles in the way of asthma education, as a result education and policy showed a noteworthy difference. Therefore, the School Health Specialists' greater involvement with education regarding

adolescent asthma management improves their knowledge of barriers. The correlation also identifies barriers as a major problem for school health specialists wishing to implement policies regarding asthma management.

Analysis of Variance

Analysis of Variance (ANOVA) is one of the most powerful methods for comparing means if two or more groups are involved (Neutens & Robinson, 2002). In analysis of variance, a ratio of observed differences is used to test hypotheses (Neutens & Robinson, 2002). An ANOVA was used to compare the means for adolescent asthma management among demographic groups (Table 13). Asthma management variables included education, policy, perception, barriers and training. Results indicate a significant difference for education ($F=7.976$, $P<.017$). Those who participated in continuing education related to adolescent asthma management over the last 12 months scored higher on education.

Table 13

ANOVA Comparing the Means for Adolescent Asthma Management Among Demographic Groups

		Sum of Squares	df	Mean Square	F	Sig.
education	Between Groups	28.259	1	28.259	7.976	.017*
policy	Between Groups	6.722	1	6.722	.634	.452
perception	Between Groups	6.519	1	6.519	3.184	.112
barriers	Between Groups	2.667	1	2.667	4.800	.071
training	Between Groups	.677	1	.677	.476	.506

Note. Correlation is significant at the 0.05 level

CHAPTER V

CONCLUSION, LIMITATIONS, AND DISCUSSION

Affecting an estimated 20.3 million persons of all ages and races, asthma ranks among the most common chronic conditions in this country (CDC, 2009). Within the state of Texas, 389,000 children are reported to have asthma (Asthma Coalition of Texas, 2007). As one of the most chronic lung diseases, Asthma continues to be a health concern in Texas (Asthma Coalition of Texas, 2007). A need exists for schools to promote asthma education by supporting students in the management of asthma through education, training and policy development. Given this context, the impact of adolescent asthma management are of special interest for those responsible with promoting a healthy school environment for students.

The Diffusion of Innovations Theory identifies and analyzes patterns of new ideas, or practice adopted by members of a social network (Rogers, 1995). Diffusion research revolves around conditions which increase or decrease the likelihood of the adoption of a new idea, product, or practice (Rogers, 1995). The purpose of this study was to examine Texas Regional Education Service Center School Health Specialists' perceptions regarding the training, education and policies of adolescent asthma management. School Health Specialists' personal perceptions and opinions on barriers related to asthma management were also assessed. Research was designed to further

understanding regarding the School Health Specialists' perceptions related to asthma management, therefore leading to the understanding of what conditions are likely to promote new ideas and practices within the school setting. In the appropriate environment, adolescents are prepared to take on the task of asthma management. The school setting is a target for asthma education because it offers unique opportunities to aid asthmatics who have not been diagnosed or who have poor control and limited access to medical care (Bartholomew et al., 2006).

Summary of Findings

The survey participants were identified as School Health Specialists in Texas. Most respondents identified a professional background in nursing, health education, counseling/mental health, social work and physical education.

Findings from this study indicated that the School Health Specialists' were willing to adopt new ideas and practices related to asthma management. More than half of the respondents felt asthma is a significant problem at middle schools within their RESC and that asthma education within the school setting is important for an asthmatic student's health. Participants believe schools within their RESC are working to improve and implement asthma management policies. They also felt confident in the abilities of school health professionals responsible for adolescents care. Although they felt confident in the abilities of school health professionals within their RESC, 73% felt they would benefit from training related to asthma management.

Challenges to school-based asthma management incorporated numerous barriers. More than 75% of School Health Specialists' agreed that barriers are involved in

adolescent asthma management. Respondents found time, availability of education materials, student compliance, parent compliance and lack of knowledge on the part of school staff as obstacles to asthma management. The majority of School Health Specialists disagreed with personal involvement in current updates regarding asthma medications and national asthma guidelines.

The study also found that most School Health Specialists' reported participation in continuing education related to asthma in the last 12 months (73%). This result is consistent with the findings that School Health Specialists' identify asthma as a serious illness impacting their RESC and are will to adopt new practices related to asthma management.

Limitations

The most significant limitation to this study was the population of interest. Texas only has one to two School Health Specialists per region, with a total of 20 regions. This left the study with a small sample size. Another study limitation was the possibility that School Health Specialist's had previous knowledge of asthma management leading to preconceived opinions.

The survey was developed with a thorough review of the literature and a review from thesis committee members. Considering the survey was a new tool developed by incorporating a variety of question from previous instruments (ALA, 2007) and the literature it provided limitations to the study. It was also adapted to meet the needs of the School Health Specialist.

Discussion

The school setting is a target for asthma education because it offers unique opportunities to aid asthmatics who have not been diagnosed or who have poor control and limited access to medical care (Bartholomew et al., 2006). Academic performance and absenteeism are strongly linked; students with asthma are absent more frequently than those without asthma, and asthma severity may be a large factor contributing to lower test score performance (Moonie et al., 2008). In the appropriate environment, adolescents are prepared to take on the task of asthma management. Further, evidence supports that adolescents are ready to take on the task of asthma management due to their development of cognitive skills and stage of psychosocial development (Bruzzese et al., 2004). Research found that education and management beliefs may vary but the key to success is establishing an appropriate environment within the school walls. Creating an “asthma-friendly” environment can be accomplished by the training, as well as collaboration of efforts by health professionals. Children with asthma, along with parents, school personnel, and health care professionals may combine their efforts leading to a positive impact on the management of asthma (Neuharth-Pritchett & Getch, 2001).

This study indicated that School Health Specialists’ were willing to adopt new ideas and practices related to asthma management. The School Health Specialists’ were aware of the problems surrounding adolescent asthma, as well as knowledgeable about training, education and policies for asthma management within their RESC.

Participants have taken the first steps in the direction of change to further develop asthma management education. The School Health Specialists’ have participated in asthma based continuing education, therefore willing to further knowledge in the problem

area. Additionally, participants were aware of the problems surrounding asthma management. Diffusion research revolves around conditions which increase or decrease the likelihood of the adoption of a new idea, product, or practice (Rogers, 1995). Rogers (1995) suggests the application of specific stages of diffusions as a requirement for the adoption to take place. The first stage, agenda-setting, is triggered by both acknowledging the organizational problem and prioritizing them for solution.

The willingness to change along with the acknowledgement for further school-based asthma management is present. School Health Specialists agreed that students have gained from school health professionals' training. Training has led to improvement within the school setting as school health professionals have increased awareness and ability to identify severe asthma symptoms. Although training has occurred, the importance of asthma management requires additional training among school health professionals.

Many policies are implemented that currently improve school conditions for asthmatic students. Policies are in place regarding medication, asthma action plans and safe environments. School Health Specialists' have indicated that the schools involvement in asthma management policies promotes staff awareness, establishes asthma action plans, reduces allergens/irritants, and provides students with an "asthma-friendly" environment.

Although this is a step in the right direction, barriers are still in place that prevent further advancement. This study identified challenges to school-based asthma management. Respondents reported time, availability of education materials, student

compliance, parent compliance and lack of knowledge on the part of school staff as obstacles to asthma management. Other barriers were identified in the review of literature such as lack of nursing support and assistance from outside health centers as well as school administration. Studies indicate that the involvement of school nurses can make a difference (Bruzzese et al., 2009). Public schools often do not employ the proper number of nurses regardless of the growing number of asthma cases and the fact that teachers may not anticipate to have on average two children with asthma in their classroom during an academic year (Neuharth-Pritchett & Getch, 2001). The adoption of school-based asthma management policies become increasing difficult with such barriers in place. As part of the adoption process the organization often needs to restructure the objectives to overcome barriers as they redefine the plan of action. Maintaining and improving health has always been one of the schools most important functions (Merkle et al., 2006). With the responsibilities of asthma management and education becoming more dependent on school-based sources, programs and school guidelines need to be set to lead to a safer and more successful outcome.

Lessons for improving the quality of school-based asthma management have emerged from the research and case study findings. Notable relationships between education, barriers and policy development were found. The School Health Specialists' greater involvement with education regarding adolescent asthma management will likely improve their knowledge of barriers impeding policy development. As asthma management programs are implemented in the school setting, a few key points should be remembered. The essential first step in education development and creating an asthma friendly environment is identifying a schools system's needs, resources, and barriers

(Wheeler et al., 2006). Each school should develop an assessment, leading to the execution of their individual needs.

Upon the completion of a needs assessment and the collaboration of a multi-disciplinary team, school representatives may opt to look into resources that are provided for the development of asthma programs. Local, state, and national agencies have developed detailed guidelines geared toward the improvement of adolescent asthma management. These guidelines offer a strong foundation to work from. A review of literature or the participation in continuing education related to asthma management often provides the resources health educators are searching for.

Recommendations for Further Research

The need for improved management of adolescent asthma in Texas middle schools and across the nation has become apparent through a review of literature and research. Within the state of Texas, 389,000 children are reported to have asthma (Asthma Coalition of Texas, 2007). The Asthma Coalition of Texas found as one of the most chronic lung diseases, Asthma continues to be a health concern in Texas (2007). Considering the detrimental impact asthma has on adolescents, stronger policy development and education could and should be carried out throughout the state of Texas. The further development and implementation of policies can improve the knowledge of professionals responsible for managing asthma within the schools. Expanding the knowledge of professionals through education can increase their awareness of barrier prevention, policy development, continuing education and further training.

Future study of adolescent asthma management within the school setting should further investigate the elements presented in this study. Several studies suggest that school-based asthma interventions can improve the health outcomes in children with asthma. However, asthma management is a partnership across the educational system. The partnerships established between schools and other health centers may be an area of further research.

Researchers may also wish to examine the adoption of specific asthma policies within the school setting. The decision making process occurring between school health professional and policy makers requires attention. In association with the adoption of policies, research on the other elements of the Diffusion of Innovations theory could be conducted.

Expansion of the study within the state of Texas is recommended. The opinion of school health personal other than School Health Specialists is important as well as the knowledge that could be gained from populations other than middle school students. Research evaluating the perceptions of school health personal, such as nurses and educators, may play in the adoption of new policies and practice related to asthma management. Asthma studies may be carried out with populations in settings other than the school. Community, hospital and clinic environments are also appropriate for asthma surveys.

This study could also be expanded outside the state of Texas and The United States. While other components should be examined in the future, the present study

represents an important step toward expanding the knowledge of asthma management within the school setting.

APPENDIX A
INFORMATIONAL LETTER

Dear (School Health Specialist's Name),

As a School Health Specialist, you have been selected to participate in a survey that will improve the understanding of knowledge, perspectives and involvement in adolescent asthma management in your schools and other Texas middle schools. This survey will be part of a graduate-level thesis study.

In a few days you will receive an invitation in your RESC email with a survey link. I have included a \$5 Starbucks gift card as a small incentive for you to participate in this study. Because your participation is voluntary, you are under no obligation to participate and can enjoy the enclosed gift card whether you choose to participate or not. The survey will take 15-20 minutes and include opinion questions about adolescent asthma management in the schools. The survey link will provide further information about the survey and give you a step-by-step completion process.

The information you give us will be kept confidential and participation in the study is voluntary. Your survey data will be used to further education in asthma management. I thank you for your participation and efforts to help develop and improve healthy adolescent asthma management practices in schools.

This research study has been reviewed by the Institutional Review Board – Human Subjects in Research, Texas State University. Pertinent questions about the research, research participants' rights, and/or research-related injuries to participants should be directed to the IRB chair, Dr. Jon Lasser (512.245.3413 – lasser@txstate.edu), or to Ms. Becky Northcut, Compliance Specialist (512.245.2102).

If you have any questions about the survey or how your answers will be used, contact Katy Snodgrass at ks1568@txstate.edu.

Thank you for your time and effort in helping me complete my thesis. Enjoy your Starbucks!

Sincerely,

Katy Snodgrass, BS, RRT

APPENDIX B

THANK YOU/ REMINDER

Date

Dear (School Health Specialist's Name),

You were previously sent an invitation to participate in an important survey to help us improve the perceptions regarding the training, education and policies of adolescent asthma management in Texas middle schools. If you have completed it, please accept my sincerest *thank you*. If you have not been able to complete this important survey, please take the time now to complete this short survey by clicking on the following link [Survey Link].

If you have any questions please contact Katy Snodgrass at ks1568@txstate.edu.

Your opinion is valuable and will help health educators advance our knowledge of school-based asthma management and health education. Your survey data will be used to further education in asthma management and help complete a graduate thesis study at Texas State University. We greatly appreciate your time and feedback.

Thank you again for your help.

Sincerely,

Katy Snodgrass, BS, RRT

APPENDIX C

INSTITUTIONAL REVIEW BOARD CERTIFICATE OF APPROVAL



Institutional Review Board Application

Certificate of Approval

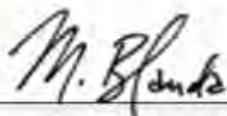
Applicant: Kathryn Snodgrass

Application Number : 2009U5654

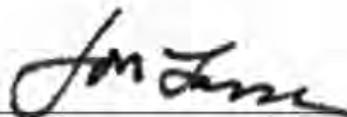
Project Title: The awareness and perceptions regarding the training, involvement and policies of adolescent asthma management from the perspectives of School Health Specialists in Texas.

Date of Approval: 12/10/09 17:13:26

Expiration Date: 12/10/10



Assistant Vice President for Research
and Federal Relations



Chair, Institutional Review Board

APPENDIX D

FINAL SURVEY INSTRUMENT

SURVEY INSTRUMENT

1. Are you a School Health Specialist at a Texas Regional Education Service Center?
Yes
No
2. What is your professional background?
Health education
Nursing
Counseling/Mental health
Social work
Nutrition
Physical education
Other
3. Are you located in a rural or urban area?
Rural
Urban
4. Have you participated in continuing education related to asthma in the last 12 months?
Yes
No
5. In the last 12 months my Regional Education Service Center (RESC) participated in continuing education related to asthma.
Strongly agree
Agree
Disagree
Strongly disagree
6. Schools in my RESC have partnerships with area clinics or providers concerning asthma management and education.
Strongly agree
Agree
Disagree
Strongly disagree
7. I stay current with asthma medication purposes and updates.
Strongly agree
Agree
Disagree
Strongly disagree

8. I stay current with national guidelines for asthma management.
Strongly agree
Agree
Disagree
Strongly disagree
9. The asthma management practices at schools within my RESC are consistent with recognized standards and guidelines.
Strongly agree
Agree
Disagree
Strongly disagree
10. How confident are you that school health professionals in your RESC have current knowledge to treat and prevent asthma episodes for middle school students at their schools?
Strongly agree
Agree
Disagree
Strongly disagree
11. How confident are you that school health professionals in your RESC have sufficient knowledge to treat and prevent asthma episodes for middle school students at their schools?
Strongly agree
Agree
Disagree
Strongly disagree
12. School health professionals in your RESC would benefit from asthma training.
Strongly agree
Agree
Disagree
Strongly disagree
13. Schools within your RESC are “asthma-friendly.”
Strongly agree
Agree
Disagree
Strongly disagree

14. School health professionals in your RESC educate parents and/or guardians about their student's asthma management.
Strongly agree
Agree
Disagree
Strongly disagree
15. Middle school students are provided with asthma education at schools within your RESC.
Strongly agree
Agree
Disagree
Strongly disagree
16. Asthma education within the school setting is important for an asthmatic student's health.
Strongly agree
Agree
Disagree
Strongly disagree
17. Asthma is a significant problem within middle schools in your RESC.
Strongly agree
Agree
Disagree
Strongly disagree
18. Asthmatic students are identified by schools in your RESC.
Strongly agree
Agree
Disagree
Strongly disagree
19. Middle schools within your RESC have adequate nursing support.
Strongly agree
Agree
Disagree
Strongly disagree
20. Time demands and paperwork are a cause for lack of asthma management and education.
Strongly agree
Agree
Disagree
Strongly disagree

21. Time is a barrier to management of asthma in the school setting.
Strongly agree
Agree
Disagree
Strongly disagree
22. Availability of education materials are a barrier to management of asthma in the school setting.
Strongly agree
Agree
Disagree
Strongly disagree
23. Student compliance is a barrier to management of asthma in the school setting.
Strongly agree
Agree
Disagree
Strongly disagree
24. Parent compliance is a barrier to management of asthma in the school setting.
Strongly agree
Agree
Disagree
Strongly disagree
25. Lack of knowledge on the part of school staff is a barrier to management of asthma in the school setting.
Strongly agree
Agree
Disagree
Strongly disagree
26. Asthma management is recognized by school health professionals within my RESC as a possible way to improve attendance.
Strongly agree
Agree
Disagree
Strongly disagree
27. Middle schools within my RESC have adopted policies to address asthma and asthma management.
Strongly agree
Agree
Disagree
Strongly disagree

28. At least one school health professional monitors information about absences of children with asthma in middle schools within my RESC.
Strongly agree
Agree
Disagree
Strongly disagree
29. At least one school health professional reports concern about attendance to appropriate personnel or counselors in middle schools within my RESC.
Strongly agree
Agree
Disagree
Strongly disagree
30. School health professionals with student contact are trained to identify asthma symptoms within my RESC.
Strongly agree
Agree
Disagree
Strongly disagree
31. School health professionals with student contact are trained to identify asthma emergencies within my RESC.
Strongly agree
Agree
Disagree
Strongly disagree
32. School health professionals with student contact are trained to learn the appropriate steps to take in asthma emergencies within my RESC.
Strongly agree
Agree
Disagree
Strongly disagree
33. Middle schools within your RESC promote staff awareness of health and wellness through presentations by health professionals, health fairs, or other in-service activities.
Strongly agree
Agree
Disagree
Strongly disagree

34. Middle schools within your RESC reduce or eliminate allergens and irritants that can make asthma worse.
Strongly agree
Agree
Disagree
Strongly disagree
35. My RESC has a written policy that allows adolescence to take asthma medications as prescribed by their doctor and permitted by parent at school.
Strongly agree
Agree
Disagree
Strongly disagree
36. Middle schools within your RESC have a written asthma action plan for each child with asthma in case of a severe asthma episode.
Strongly agree
Agree
Disagree
Strongly disagree
37. My RESC has a model for a written asthma action plan for children with asthma in case of a severe asthma episode.
Strongly agree
Agree
Disagree
Strongly disagree

APPENDIX E

COVER PAGE FOR THE EMAIL INVITATION TO THE ONLINE SURVEY

AND COVER PAGE FOR THE ONLINE SURVEY

**(THE FOLLOWING WILL BE THE “COVER” PAGE FOR THE EMAIL
INVITATION TO THE ONLINE SURVEY)**

Dear (School Health Specialist’s Name),

Last week you should have received a letter in the mail and a \$5 gift card from me, informing you that you will be invited to participate in a survey about asthma management and education. As a School Health Specialist, you were selected to participate in the survey. This study will improve the understanding of training, education and policies in adolescent asthma management in your schools and other Texas middle schools. This survey is also part of a graduate-level thesis study.

This correspondence is your invitation to participate in the study. The survey will take 15-20 minutes and include opinion questions about adolescent asthma management in the schools. The survey link will provide further information about the survey and give you a step-by-step completion process.

The information you give us will be kept confidential and participation in the study is voluntary. Your survey data will be used to further education in asthma management. I thank you for your participation and efforts to help develop and improve healthy adolescent asthma management practices in schools.

This research study has been reviewed by the Institutional Review Board – Human Subjects in Research, Texas State University. Pertinent questions about the research, research participants' rights, and/or research-related injuries to participants should be directed to the IRB chair, Dr. Jon Lasser (512.245.3413 – lasser@txstate.edu), or to Ms. Becky Northcut, Compliance Specialist (512.245.2102).

If you have any questions about the survey or how your answers will be used, contact Katy Snodgrass at ks1568@txstate.edu

Thank you for your time and effort in helping me complete my thesis. Please take the time now to complete this short survey by clicking on the following link [Survey Link].

Sincerely,

Katy Snodgrass, BS, RRT

**THE PERCEPTIONS REGARDING THE TRAINING, EDUCATION AND
POLICIES OF ADOLESCENT ASTHMA MANAGEMENT FROM THE
PERSPECTIVES OF SCHOOL HEALTH SPECIALISTS IN TEXAS.**

Consent Form for Survey

PURPOSE OF THE STUDY:

The purpose of this study is to understand the perceptions regarding the training, education and policies of adolescent asthma management from the perspectives of School Health Specialists in the Texas Regional Education Service Centers.

WHAT WILL BE DONE:

You will complete an online survey, which will take 15-20 minutes to complete. The survey includes questions about the training, education and policies in adolescent asthma management from the perspective of a school health specialist in Texas. (After you complete the questionnaire; we will examine your entries and will record information about your submitted answers.)

BENEFITS OF THIS STUDY:

You will be contributing to knowledge about developing and improving healthy adolescent asthma management practices in schools. After we have finished data collection, we also will provide you with more detailed information about the purposes of the study and the research findings.

RISKS OR DISCOMFORTS:

No risks or discomforts are anticipated from taking part in this study. If you feel uncomfortable with a question, you can skip that question or withdraw from the study altogether. If you decide to quit at any time before you have finished the questionnaire, your answers will NOT be recorded.

CONFIDENTIALITY:

Your responses will be kept completely confidential and remain unavailable to faculty and staff members. Responses were securely transmitted and merged into a database for statistical analysis.

DECISION TO QUIT AT ANY TIME:

Your participation is voluntary; you are free to withdraw your participation from this study at any time. If you do not want to continue, you can simply disregard the survey. You may choose to skip any questions that you do not wish to answer. Any other information that you feel is important may also be included in the comment section.

HOW THE FINDINGS WILL BE USED:

The data will be used to make recommendations to School Health Specialists and may also be used for professional presentations or published in a peer reviewed journal.

CONTACT INFORMATION:

This research study has been reviewed by the Institutional Review Board – Human Subjects in Research, Texas State University. Pertinent questions about the research, research participants' rights, and/or research-related injuries to participants should be directed to the IRB chair, Dr. Jon Lasser (512.245.3413 – lasser@txstate.edu), or to Ms. Becky Northcut, Compliance Specialist (512.245.2102).

If you have concerns or questions about this study, please contact Katy Snodgrass, RRT at ks1568@txstate.edu.

By submitting the survey, you acknowledge that you have read this information and agree to participate in this research, with the knowledge that you are free to withdraw your participation at any time without penalty.

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VITA

Kathryn Lauren Snodgrass was born in Olathe, Kansas, on October 20, 1984, the daughter of Kimberly and Galen Snodgrass. After completing her work at Carthage Senior High School, Carthage, Missouri, in 2003, she entered Missouri State University. She received the degree of Bachelor of Science from the University of Missouri-Columbia in May 2007. During the following years she was employed as a respiratory therapist in Austin, Texas. In August, 2008, she entered the Graduate School at Texas State University-San Marcos and was a candidate for Master of Health Education (M.Ed.) in May 2010.

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